DRM 2

What to do?

A: Remind you of the charge

- Develop a final DRM for WFIRST that does not duplicate the capabilities of Euclid and LSST. Assess options for meeting all of the New World New Horizon requirements with the combination of Euclid, LSST, and a WFIRST DRM. Assess the science impact of such options.

  Examine options for reducing overall cost of the mission.

  The mission design is to be technically capable of a launch by the end of calendar year 2022.

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What this is not

- This is NOT a license to re-design WFIRST from the ground up (in my opinion)
- The NWNH requirements still apply, and to expand our capabilities beyond those needed to meet the NWNH requirements is not what I believe is requested here – since we believe that IRDM meets the NWNH requirement, expansion of our capabilities is not required

Two steps

- Identify the “capabilities” that are duplicated between WFIRST and EUCLID, LSST & JWST

- Once we have identified the duplicative capabilities, we re-imagine a mission that meets the remaining NWNH objectives in the most cost-effective fashion

- First: what do we mean by “capabilities”

Capabilities

1: *Scientific* capability

e.g. BAO, weak lensing, microlensing, etc.

2: *Observational* capability

e.g. slitless spectroscopy with a spectral resolution of X over a bandpass of Y

imaging sky survey with an effective shape knowledge of X over Y bandpass in Z colors

3: other perspectives may exist

Meeting the NWNH requirements

- To meet the charge, if we drop a capability from WFIRST, we are admitting that the NWNH requirements are being satisfied, in that area, by Euclid+LSST+JWST w/o WFIRST
  - i.e. there is no reason to have that capability at all on WFIRST – either we need it, or we don't
- Reducing, but maintaining a capability, makes no sense with respect to our instructions

The Hard Part

First we must determine what duplicative capabilities are not required on WFIRST in order that that

E + L + J - W still meets the NWNH requirements

- Ask this:
  - Does E + L + J – W meet the NWNH requirements to perform: BAO, RSD, WL ?

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- Ask this:
  - Does E + L + J – W meet the NWNH requirements to perform: BAO, RSD, WL ?
  - I feel that the recent NRC report has answered this question for us.

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- Ask this:
  - Does E + L + J – W meet the NWNH requirements to perform: BAO, RSD, WL ?
  - However, if we disagree, we can start dropping capabilities (this is the hard part)

The Easy Part

- Once we know what capabilities we no longer need – we redesign the mission
- Such a mission will presumably perform fewer overall tasks, so that more time is available for the remaining tasks, potentially allowing a smaller aperture, smaller/fewer detectors arrays, etc. (we have to do something to make it cheaper)

The Even Harder Part

- Now – we have to sell this descoped mission to the community and the mid-decade review.

- We are walking a narrow path with a cliff on either side
  - WFIRST may not happen because its costs are incompatible with NASA's resources
  - WFIRST may not happen because a descoped mission is insufficiently compelling to justify even the reduced resources it would require